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ABSTRACT

If a toy is classed as "educational," some demonstrable educational outcome ought to result from playing with it. Formerly, games and toys designated as "educational" were often strategies for painlessly imparting school subjects to children. Today, "developmental skills" or "readiness experiences" are typical objectives of many of the toys on the market for pre-school children. To date, there is no published evidence to indicate that any educational benefit can be directly attributed to the use of these toys. Yet any claim as vague as "developing a child's full potential" or "providing him with appropriate experiences" has little hope of being proved or disproved. Such claims worry parents wishing to provide their child with the best possible start in school. Pressed for evidence, toy manufacturers fall back on educational generalizations, or protest that findings cannot be disclosed lest they fall into the hands of the competition. Educational theorists quoted here proclaim the educational value of most toys to be overrated. (KC)

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HOW EDUCATIONAL ARE EDUCATIONAL TOYS?

H. Robert Quilitch

An abbreviated version of this paper was published in Saturday Review-World, November 16, 1974, under the title "Can Toys Really Teach?" The research described represents one in a series of studies conducted by members of the Living Environments Group at the University of Kansas under the direction of Todd R. Risley. The author is presently Director of Psychology at Nevada Mental Health Institute, Box 2460, Reno, Nevada 89505.

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HOW EDUCATIONAL ARE EDUCATIONAL TOYS?[1]

Most modern, concerned parents are eager to provide stimulating early experiences to help develop their children's fullest intellectual potential--and to avoid the shattering prospect of having an "academically retarded" youngster.

Much of their concern is artfully instilled and exploited by toy makers' advertising and promotional efforts. These are often couched in emotion-laden terms more likely to threaten than to enlighten young parents and calculated, not to inform them, but to bully them into buying expensive specialty toys.

In fact, there is virtually no research on the effects of so-called educational toys, no believable evidence to support even the mildest claims of educational usefulness. No one, least of all the toy manufacturers, has presented any evidence that educational toys even exist. Educational toys may exist, depending upon what is meant by "educational." Parents would be well advised, however, to ignore unsupported advertising claims and to base their toy-buying decisions on one simple criterion: whether

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the toy in question, assuming that it is safe to use, is one which their children will enjoy. Until more is known about educational toys, this is all that parents can really do.

People generally agree that a particular item is a toy if children use it for play over a period of time. The next question, whether a given toy is educational, is quite a different matter. Some experts say that everything a child plays with is educational, while others view only those toys designed to help teach specific skills as educational. Perhaps we can begin to sort out this area of confusion by briefly looking at toys considered educational in the past.

The Norwich, England, museums contain a large collection of "teaching toys" dating back to the 17th century. Many of these were probably designed to be administered by an adult to help children learn large, organized bodies of facts. Jigsaw puzzles may have been used in this fashion. Two of the earliest examples are maps of Africa and America, published in London in 1772. From the 1800s came such puzzles as The Progress of Coffee Neatly Dissected, The History of the Sabbath, and The Life of Moses. Sets of printed cards, forerunners of our modern flash cards, were used to instruct such subjects as The Pence Table, Heathen Mythology, Great Men and Their Works, and The Sovereigns of England. These early educational toys, like their contemporary counterparts, were touted to parents as aids to help raise brighter children.

> "This being a Scientific Game, in which the Amusement and Instruction of the Parties are equally considered, we hope the Young Player will not think much of exercising his Memory to Acquire a perfect knowledge of it. Most games are cal-

culated only to promote little Arts and Cunning, but this, while it will amuse, will not a little contribute to make the Players acquainted with the Geneology of their own Kings."[2]

The Japanese brought out elaborate sets of dolls for public display during Boys' and Girls' Festivals in order to explain the social hierarchy and history of their country. In this country, the Hopi Indians distributed kachina dolls during ritual celebrations to teach children aspects of their religion.[3] Such games as Growth of a Century, published in 1889, were designed to teach the names of our Presidents, while the Game of the American Story and Glory, 1846, was used to teach American history. These toys and games were probably used by adults and children together, preparing children to answer such questions as "Can you name the Presidents of the United States?"[4]

Judging from historical accounts of early toys, morals were once considered almost an academic subject, deliberately taught to children by their elders. Abbé Gaultier, a Frenchman who lived in London, used a game to teach morals, or simple statements about desired social conduct. He published The New Game of Virtue Rewarded and Vice Punished for the Amusement of Both Sexes in 1810.[5] Milton Bradley's very first game, The Checkered Game of Life, published in 1860, outlined many of the virtues necessary to a young man interested in getting ahead in life.[6] In the late 1800s, George S. Parker developed a series of semi-moralistic games such as The Game of Banking, The Grocery Store, Christian Endeavour, and The Game of Business or Going to Work.[7]

It seems likely that these sorts of toys and games were designed to be administered by an older child or adult to a younger child.

This would certainly be the case with complicated toys requiring an initial period of instruction. Children today probably spend many hours playing Monopoly with more experienced players before they are ready to play on their own. These items might be appropriately labeled as educational aids and not educational toys since the actual teaching would probably be carried out by an adult with the assistance of one of these games. Parents buying educational toys are often led to believe that their presence is not required for the toy to teach a skill to their child.

> MATTEL-A-TIME CLOCK responds to your child's desire to learn to tell time--all by himself.[8]

In the early 1920s, A. C. Gilbert began to sell chemistry sets, sound experiment sets, hydraulic engineering sets, civil engineering sets, and small weather stations. These kits were apparently sold with the expectation that by providing youngsters with a miniature version of equipment normally available only to adults, he might play, construct and learn all at the same time. If this is true, it is probably one of the most clear-cut examples of a type of educational toy that we shall find. Yet, this is not the type of educational toy which has been recently promoted heavily to parents of young children.

Thus, we have clear examples of toys and games provided by adults for assistance in the instruction of children for at least the past two hundred years. It seems likely that adults interested in teaching their youngsters would use these toys to entertain children and make the process of learning as much fun as possible. While we have no

information on how effective these educational aids were, in almost every case we have a clear description of just what each toy was intended to teach. Sovereigns of England was a game designed to teach childrer of England to name their kings. Any one of these early educational toys would have probably been rather easy to evaluate since their educational goals were so precisely spelled out for parents to see before they bought the toy. To continue with the example above, it would be a simple matter to devise an instructional format for teaching children to recite a list of English kings, both with and without the use of the game. Controlling for other factors that might make a difference in outcome, teachers could instruct two groups of children in this skill, but only using the game with one group. If effective, the children instructed with the use of the game should learn to recite these names better than their peers who learned without the benefit of the toy. As we shall see, many modern educational toys would not be nearly as easy to evaluate since their educational goals are generally very vague.

The educational toys sold more recently, those of special concern to parents and educators, are often described as "developmental" and tied to the notion of increasing children's intelligence by providing them with an "enriched environment." While an enriched environment is a source of extra stimulation offering added opportunities for learning, within the context of appeals made to parents by toy manufacturers, it more plainly describes an environment filled with educational toys.

> No other center is as conducive to learning as a child's home. Whether the child develops a love

> for learning, whether he gives a qualitative meaning to his newly acquired vocabulary--all these depend upon the kind of play and learning materials which you bring into the home."[9]

These toys are advertised to parents as teaching visual discrimination, helping a child achieve his full potential, teaching a concept such as cause and effect, providing appropriate experiences, and guiding him, through play, toward discovery of himself and the world around him. The only consistent characteristic of most of these modern educational toys is that their goals are stated so vaguely as to defy description and evaluation. How do we know, for example, when a child has reached his "full potential"?

Modern educational toys, heavily advertised and generously boosted as essential for normal development by educational consultants, help create confusion and needlessly worry parents. The actual effects of these toys, sold to help develop children's thinking, intelligence, problem-solving skills, color and form discrimination, and even I.Q. itself, represent the area most requiring clarification and objective study for the benefit of concerned parents and their children.

Toy manufacturers have a sizeable financial interest in the marketing of their educational or preschool toys.

> From 1965 up to the present, pre-school toys have been <u>the</u> glamour category of the toy industry. Accounting for approximately 4% of the industry in 1965, this category has grown to a point where, for some retail outlets, it accounts for as high as 15%.[10]

Unfortunately, there is no available research indicating that educational toys even exist, let alone are as commonly available as parents are led to believe.[11] If there is virtually no evidence that any toys ever have been proven to be educational in any way, then why does this class of toys continue to grow in size and sales? A Fortune article provides us with some insight into the methods used to create a desire for preschool educational toys:

> Advertising to mothers will continue to increase for still another reason. During the Seventies, the number of women of child-bearing age will increase sharply, swelling the population of preschool children...Many toy companies that have ignored the preschool market are now scrambling into it, and that is a market where it is often more important to win the mother's favor than the child's...It appears that some toy companies intend to capitalize on mothers' naivete. Parents have in the last few years exhibited a preference for toys that appear to be "educational." Increasingly, toys are showing up on the market that have been "scientifically developed" by prominent educators who have lent or rather sold, their names for use in the products advertising. Toys that purport to teach such things as object permanence (the ability to remember the existence of something even if it is out of sight) are being marketed for children under a year old.[12]

Research scientists generally attempt to publish accounts of their research in professional journals in order to keep each other aware of their work. These research reports must be found acceptable by the editors of the journals prior to publication, and, once published, may be further evaluated by large numbers of other scientists. Complete summaries of their experimental procedures and results must be intelligibly presented in these reports so that their work can be evaluated. Professionals who endorse educational toys, however, seldom mention what research they have carried out with the toys being promoted and never include the results of that research in the advertisements. These educational consultants are paid to endorse a product in the hope that this aura of "scientific respectability" will convince parents to purchase the toys they mention so that their children will magically become more like the endorsers themselves--in much the same manner that a healthy athlete like Mark Spitz endorsing milk capitalizes on parents' hopes for healthy children.

The important popular literature in this area, then, is not being produced by developmental specialists or educators, but by the toy manufacturers. Laden with quasi-scientific pronouncements, and backed by prominent educators, the emotional appeal of such promotion is doubly effective for young parents (and especially devoted grandparents):

> Creative Playthings concurs with Dr. Bloom that what a child loses by failing to develop in the early years, he cannot make up later on. Environmental handicaps can become an important cause of academic retardation.[13]

Preschools have picked up the same rhetoric in their appeals to parents:

> This is the most important time in your child's life. What are you doing about it? If Tommy likes to learn and Billy doesn't...Tommy will be ahead of Billy for the rest of his life. As much as 80% of a child's total adult intelligence is determined by the time he reaches six. To start a child in school at age six is like entering him in a race when it's half over.[14]

Claims become even more strident. The logic of Head Start-type intervention programs was applied, with no firm scientific support, in an effort to sell toys which would somehow "enrich" children's environment. Some claims come very close to promising that certain toys will increase children's I.Q.:

> No one will deny that the home is the child's first classroom and his parents his first teachers....It is claimed by psychologists (See Stability and Change in Human Characteristics by Benjamin S. Bloom, John Wiley & Sons, 1964), that a planned environment can affect intelligence in the first four years of life by about 2.5 I.Q. points every year...This would make it appear that the earliest years are the most powerful learning years and that they can never be retrieved, no matter what is done in later periods. This is why Creative Playthings caters especially

to the early years...Parents must examine carefully everything they introduce into the child's environment. They must know the moment of readiness. You can help your child achieve his full potential.[15]

Childhood is a never again moment. Once it is lived, it is gone. And if it is not lived in its fullest measure, it may seriously limit the extent to which the child can develop as an intelligent and self-fulfilled adult...Nowadays, it is well known that the richness of a child's environment has a profound effect on his later life. Recent research has shown that as much as 80% of a child's intelligence is developed before the age of 6-thus making the early years the most critical period of his life.

Signed: Sandra M. Brown, Ph.D., Educational Consultant.[16]

Dr. Brown's reference to "80% of a child's intelligence" is related to the idea that a child's environment may affect his intelligence by as much as 20 I.Q. points between infancy and adulthood, almost certainly an indirect reference, made by many other toy companies as well, to the research reported in Dr. Bloom's 1964 book. Only a portion of this book deals with the question

of intelligence. Dr. Bloom summarized the work of several authors demonstrating that children raised in extremely and profoundly deprived environments might have their I.Q.s affected by as much as 20 points. No reference was made to children being raised in middle class or even ghetto homes. The deprivation cited by Dr. Bloom was much greater than would ordinarily be suffered even by poor, ghetto children--as might be experienced in custodial institutions and places where children were seldom or never talked to, where they had no access to books, radios, newspapers or television. In discussing important elements of the deprived environment and the ideal environment, Dr. Bloom never mentions the importance of educational toys. In fact he does not seem to be impressed by educational toys in any way. In reply to my inquiry, he wrote, "While I think games and child play can be of great value in early learning, I am not convinced that commercial toys are necessary or even useful for such learning."[17] Essentially this same position was taken by the American Academy of Pediatrics early in 1973, saying that common household objects may be as adequate for use as developmental toys as the special products so advertised, and that those who claim that use of their product will provide a specific educational or developmental advantage should be suspected by parents and pediatricians alike.[18]

The catchphrase in one of our examples, "a never again moment," is an oblique reference to the notion of the "critical period," a time in the child's mental development during which, it is claimed, he must receive adequate stimulation or perhaps suffer some degree of retardation for the rest of his life. Plausible as it sounds, the idea is one advertising copywriters find more useful than scientists do.

Two pediatricians, Drs. Peter H. Wolff and Richard I. Feinbloom of the Harvard Medical School, were apparently being besieged by so many mothers frantic to buy the "right" toys and provide the "proper" environmental stimulation for their youngsters, that they wrote an article in the professional journal Pediatrics. They commented on the emphasis being placed on early environmental stimulation by educators and toy manufacturers, and the role this stimulation was supposed to play in helping insure proper mental development of children. This sort of advertising, they found, seemed to create worried parents. They reviewed the scientific literature around the "critical period" of learning and concluded:

> There is no evidence at present to support the assertion that biologically fixed critical periods control the sequence of cognitive development, no evidence that scientifically developed toys are in any way superior to the usual household items available to most infants, no evidence that the systematic application of such toys accelerates intellectual development, and no persuasive evidence that acceleration of specific skills during the sensory motor phase of development, even if possible, has any lasting effect on intellectual competence. Until more persuasive evidence is presented, it seems unethical for toy companies to invoke the concept of critical periods to sell their products; for academic consultants

> in the behavioral sciences to lend their authority to the promotion of such toys and for private industry and the federal government to join forces in creating an infant development market which will assure industry a large profit.[19]

Dr. Jerome Kagan of Harvard University was paraphrased on this point in the December, 1972, Reader's Digest:

> The educational value of toys has been overrated... Possibly toys may help a child learn certain skills earlier than he would ordinarily. But other youngsters easily catch up, and there is no evidence, according to Professor Kagan, that such toys will help develop your child's brain, increase his motor coordination, his sensory awareness or make him any smarter in the long run.[20]

Finally, one further point requires clarification. Some parents seem to be misled by the fact that certain educational toys carry the Parents' Magazine and Good Housekeeping seals of approval. Neither organization attempts to determine whether educational toys are actually educational. They mainly determine whether the product is durable and whether it poses physical hazards to the user.[21]

Clearly then, the toy-buying public needs solid, objective information about the effects of educational toys, information based on scientific assessments of their educational value. This can only be initiated by first specifying just what it is that a toy is supposed to teach. It is important to remember that if a toy's educational goals

are not clearly spelled out, it can never be tested.

> Good toys are playtools which enable a child to develop his senses, to digest his experiences, to master himself and his problems.[22]

> The formboard should develop ability to see and to differentiate objects meaningfully and accurately in the visual field.[23]

> By playing with creatively designed toys with built-in challenges, children can be prepared to cope normally and successfully with the rigors of real life ahead.[24]

These descriptions are enticing and seductively couched in very positive terms. Most parents would want their child to "master himself" and "cope normally and successfully with the rigors of real life ahead," but these goals are stated in rather broad, semi-emotional language, totally impossible to test or verify. A research scientist, asked to determine whether a particular toy would enable a child to "master himself and his problems" would throw up his hands in despair.

Sometimes these ads contain ingenious combinations of vague and specific promises:

> We know that proper playthings and the proper organization of a child's environment encourage self-discovery, provide inner models on which educational platforms are built, and from which

language and reading flow.[25]

Here the manufacturer leaps from proper playthings (his) to "educational platforms" (whatever they are) to--and now he's very specific--language and reading! The implied promise is clear. Similarly:

> Children are fascinated with the Color Sorter that appears on page 6. The young will spend hours with it... shaking and turning the colorful cylinder with delight. And, although it appears that the child is simply engaging himself in an idle game, he is really learning one of the most important early skills--visual discrimination. Unless this skill is developed, the child will not be able to undertake such later complex tasks as reading, writing and spelling.[26]

Don't the toy makers themselves carry out research on toys? Some educational consultants appear to be carrying out research sponsored by the toy companies, but since it is not published it can not be evaluated by other professionals:

> Under Dr. Burton White's direction, based upon his continuing testing and observation, Kenner created Playtentials..the first planned series of developmental crib toys designed to entertain baby, enrich his surroundings, match his emerging interests, provide appropriate experiences, guide him, through play, toward discovery of himself and the world around him.[27]

Unfortunately, these educational consultants are unable to share the results of such research, apparently because it has been sponsored by a manufacturer and the data, therefore, belongs to him. Another consideration seems to be that rival manufacturers may use the data to improve their own products. While this may be true, it does pose a difficult problem for the interested consumer, since data is being used to sell a toy while the data itself cannot be critically examined by any professional outside the immediate circle of the researchers who produced it.

Even toy companies claiming no educational consultants say they carry out their own toy research:

> Working in close cooperation with nursery schools, educators, experts in child behavior and child psychologists, Playskool Research designs, tests, and constantly improves toys to meet the myriad needs of the rapidly growing child.[28]

> Creative Playthings, Inc. maintains a permanent 27-member research and design staff at Princeton Junction, New Jersey. In typical classroom and playroom settings, toys and equipment are used and tested. Children's reactions are studied and noted.[29]

These toy companies maintain the same web of secrecy over their research as do the educational consultants. Letters of inquiry are either not answered, or are answered with indecipherable jargon:

> If an individual is fluent in the developmental processes, he then uses this information in reviewing and creating toys for specific age groups. For example, if in an infant's development, a special skill is ready to emergy, one can help in this emergence by creating a toy or a game which will compliment these skills. In essence this is what we do at....[30]

Or answered with claims of a need for secrecy:

> We have used a two-stage play test area process to insure that each item in the line performs as intended. Samples of each product were tested for 3-6 months in the homes of a group of babies. The results of these tests were evaluated, the products were redesigned as necessary and further play tests were conducted before any product went into production. I am afraid, however, that these various play test reports are not suitable for public release.[31]

Answers such as this continue to raise the same question: Is it reasonable that secret data be used publicly to sell merchandise? Is this not akin to recommending that someone purchase a car on the basis of road tests which are never made public?

The educational qualities of a toy can be tested rather simply in many cases. The skills which the toy is intended to teach must be

clearly specified, time-telling, for example:

> We know consistency and repitition are essential if your child is to attain this important skill. That's why we developed MATTEL-A-TIME CLOCK--a toy always ready to tell him the time. MATTEL-A-TIME CLOCK responds to your child's desire to learn to tell time--all by himself.
>
> Ruth Handler, President
> Mattel, Inc.
>
> 32

Once specified, a reliable measure of this skill then needs to be devised. Certain goals, such as "encouraging self-discovery," sound worthwhile but would be exceedingly difficult to reliably measure, while time-telling could be rather easily tested. One method might be to prepare a series of photographs of a large wall clock set to different combinations of hour and five-minute intervals. Children could be easily shown a standard series of 12 such pictures, asked what time the "clock says it is" and their answers scored.

The conditions under which an educational toy is to be used would have to be specified in advance before it could be tested. Should it be used with an adult or only with a child (as in the Mattel ad above)? If a child needs to use a toy for a certain period of time in order to learn from it, this also should be mentioned. Once this is taken care of, it would be a simple matter to test two groups of children on a skill, provide one group with the educational toy under the appropriate conditions

for a period of time, and then test both groups of children again. If the educational toy works as specified, the children who had it should be far ahead of their peers in the skill. It is assumed that a toy must be fun to play with before it could possibly be educational, but this is the manufacturer's problem, not the researcher's.

The MATTEL-A-TIME CLOCK is advertised for children from 4 to 8. Dr. Todd R. Risley of the Department of Human Development at the University of Kansas, and I were curious about the effectiveness of this educational toy and carried out a series of short studies to test its effect. In an evaluation of this $16 toy, 10 first grade children who could not tell time at all and 10 third grade children who could tell time somewhat were tested, given free CLOCKS and again tested about two months later. We found that neither group of children had learned to tell time much better or faster than matched groups who had not been given CLOCKS.[33] I don't mean to single the MATTEL-A-TIME CLOCK out as a bad toy, but simply to illustrate the point that it <u>is</u> possible to evaluate the effectiveness of this and similar toys.

Nothing I have said in this article should be taken as a claim that educational toys, however defined, do not exist. It should be obvious by now that there is, really no evidence to make a convincing case either way. Rather, it seems reasonable to assume that in certain cases, children do learn from their play with toys.

<u>What</u> they learn can only be specified through painstaking observation of children and their play with toys. No amount of endorsements will ever obviate the need for first-hand observations gathered in play situations with children actually using the toys being tested.

Toy manufacturers would probably be well advised to concentrate on developing safe and durable toys which children enjoy using for play.

This is no small goal itself. But if a manufacturer feels compelled to boast of the "educational" value of his toys, then parents have every right to expect that he will have tested his toy with children and publish reliable data to back up his claims.

> Psychologists and social scientists in recent decades have put substantial effort into finding out how and why children play. Conclusions from their studies--some still tentative--frequently find their way into magazine and newspaper articles which have led many parents to become overly concerned with the "educational value of toys." Such concern is unhealthy when it is allowed to undermine what should be the prime objective in choosing any toy--to get something the child will use and enjoy.[34]

This is as true today as it was when it appeared in Consumer Reports in 1958.

References and Footnotes

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2. Historical references to this point, pages 2 and 3, were drawn from Teaching Toys in the Norwich Museums Collection by R.M.R. Young of Norwich, England: Roberts Printers, 1966.

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25. Creative Playthings, cited in No. 13 above, p. 2.

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31. Letter from the Product Line Manager of a toy manufacturer to author, October 25, 1972.

32. Promotional message cited in No. 8 above.

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